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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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7590 07/21/2008				
Connie M. Thousand Northrop Grumman Space & Mission Systems Corp. One Space Park Bldg. E1/2041 Redondo Beach, CA 90278			EXAMINER PUENTE, EVA YI	
			ART UNIT 2611	PAPER NUMBER
			MAIL DATE 07/21/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/773,072

Applicant(s)

TOLAND ET AL.

Examiner

EVA Y. PUENTE

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 4/8/08.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/55/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 4/8/08 have been fully considered but they are not persuasive. Examiner has thoroughly reviewed Applicant's arguments but firmly believes that the cited reference reasonably and properly meet the claimed limitation as rejected.

Applicant's argument – (1) Applicant disagrees with rejection made under 35 U.S.C. 112, first paragraph. (2) Prior art Santhoff failed to disclose multiple antenna arrays, with each array having multiple antenna elements. Santhoff also failed to disclose that the signals that are provided to the separate delay circuits correspond to individual user streams, or that the delays circuits correspond to different segments of the antenna.

Examiner's response – (1) Claims 4-6 and 10-12 are interpreted in light of the specification paragraph [0016]. Claimed recitation "a unique combination of a UWB frequency" is interpreted as a result of different user associates with different frequencies, which direct to different carrier frequencies. However, the specification never explained or described in details of how the different carrier frequencies are controlled. According to Applicant's remark, Applicant agrees and admits that it is well known the UWB technology is carrier-less (carrier free), but this contradict to the instant specification. The specification, on the other hand, discloses that the UWB pulses are associated with carrier frequencies (as stated above [0016]). Even applicant's assertion, UWB pulses are transmitted and occupy a frequency band, is true for the sake of

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argument, after carefully review of the specification, the specification never disclosed how to control the frequency band and antenna array. Therefore, claims 4-6 and 10-12 lack enablement requirement. (2) Both prior art Santhoff et al and instant application direct to beam steering in an UWB communication system. Santhoff et al depicts a very similar UWB antenna array structure as the current application (10 in Fig. 3), wherein comprises four arrays (15), and each array comprises multiple antenna elements (UWB beams 20 produce four antenna elements show in Fig.4 as R1-R4). The received data are received at four receptors (inherent as antennas) on the multiple arrays 15 (Col 4, L55-67). Santhoff also stated that his invention is to allow an UWB communication system to accommodate a different number of users, data rate and distance while minimizing multiplath effect (Col 4, L13-17). As shown in Fig. 4, each antenna receives data individually (R1-R4). It is inherent that each user stream is applied to different antennas or the combination thereof. Therefore, applicant's argument is not persuasive and Santhoff et al meet the claimed limitations.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 4-6 and 10-12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in

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the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 4, 6, 10, and 12 are direct to frequency reuse in UWB communication system. However, UWB technology is impulse radio or **carrier-free** wireless communication system. This means that there's no carrier frequency in the radio frequency spectrum. The UWB pulses are transmitted without modulation onto a sine wave carrier frequency. Therefore, the claims are not described in such a way as to enable one skilled in the art to pertain.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-3, and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Karaoguz et al (US 2005/0090200) in view of Santhoff et al (US 7,042,417).

a) Regarding to claims 1 and 7, Karaoguz et al disclose for use in an ultra wideband (UWB) communication system, apparatus capable of directing selected UWB pulses to and from selected multiple users, the apparatus comprising:

means for separating UWB pulses into individual user streams of pulses and applying each user stream to generate individual user beams containing only pulses intended for those respective users (Fig. 2A; [0015]).

Karaoguz et al disclose all the subject matters above except for the specific teaching of a wideband antenna structure.

However, Santhoff et al disclose an ultra wideband antenna array structure (10 in Fig. 3), wherein comprises multiple arrays ("N" 15), and each array comprises multiple antenna elements (UWB beams 20 produce four antenna elements show in Fig.4 as R1-R4. Col 4, L55-67). This approach diminishes multi-path problem (Col 1, L26-37). Therefore, it is obvious to one of ordinary skill in art to combine the UWB antenna structure of Santhoff et al with the UWB user system of Karaoguz et al. By doing so, reduce multi-path effect and improve overall quality in UWB communication system.

- b) Regarding to claims 2 and 8, Karaoguz et al disclose wherein the means for separating UWB pulses into individual user streams comprises means for assigning to each user a particular allocation of UWB time slots ([0015]).
- c) Regarding to claims 3 and 9, Santhoff et al disclose the means for separating UWB pulses into individual user streams comprises means for applying each user stream to a different segment of the antenna (Fig. 4; Col 4, L8-17).

Conclusion

6. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eva Y Puente whose telephone number is 571-272-3049. The examiner can normally be reached on M-F, 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on 571-272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Eva Yi Puente
/E. Y. P./
Examiner, Art Unit 2611

July 7, 2008

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/Chieh M Fan/

Supervisory Patent Examiner, Art Unit 2611